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Forest Service
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On May 4, 2000, we met to evaluate the cause of juniper tree dieback in a localized area on the reservation. The purpose of this letter is to document our findings.

The affected trees were all located in a draw. Dieback symptoms were mostly in the upper crown of affected trees, with death of entire branches back to the main bole of the tree. Some trees had entire tops killed back and there was some whole tree mortality. Affected junipers were small to medium in size, and no large trees were affected. The needles on dead limbs were all the same color (sorrel) among affected trees, indicating damage occurred at the same time and was likely caused by a winter weather event.

Several different types of injury can occur to plants in winter. Two suspected causes in this situation are winter desiccation and low temperature injury. Winter desiccation is the name given when plants experience water deficits during a period of warm weather while the soil is still cold or frozen. Water evaporates from needles but roots extract insufficient water to replace the loss. Winter desiccation may lead to chlorosis and foliar browning, to dieback of twigs, and in some cases to radial cracks in sapwood of the trunk. Low temperature injury occurs following a period of unusual warmth, when the temperature drops rapidly to a level normal or subnormal for the season, allowing the inner bark to freeze. Low temperature injury can cause top kill.

Without looking into weather records, it is difficult to state the specific cause of the juniper dieback. However, we know the weather during the 1999-2000-winter season was atypical, having scant moisture and much warmer temperatures for much of the season. Since there were also periods of normal to subnormal temperatures, it is feasible that an extreme change took place that lead to the juniper dieback and mortality, especially in the draw that is drainage for cold air. Other factors that may have contributed to such an event are the high densities of juniper in the affected area and the fact that these trees are occupying areas formerly inhabited by grasses and shrubs. This is not likely to be the start of a trend, but may repeat under similar predisposing factors.

If you have questions or concerns please call (520) 556-2075.

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